Course Number	CS 404	Course Title	Autonomous Mobile Robots
Semester Hours	3	Course Coordinator SP20	Henry Hexmoor
Catalog Description	This course is a comprehensive introduction to modern robotics with an emphasis on autonomous mobile robotics. Fundamental of sensors and actuators as well as algorithms for top level control are discussed. Multi-robotics and human-robot interaction issues are explored. A group project is an integral part of this course.		

Textbooks

FA20

Hexmoor, H. (2013). *Essential Principles for Autonomous Robotics*, Morgan and Claypool. ISBN: 9781627050586.

References

Course Learning Outcomes

- To understand the robotic platforms and their limitations.
- To learn to program mobile robots.
- To design automations solutions using mobile robots.

Assessment of the Contribution to Student Outcomes

Outcome →	1	2	3	4	5	6
Assessed →		X		X		X

Prerequisites by Topic

CS 330 with a grade of *C* or better or graduate standing.

Major Topics Covered in the Course

1. Introduction {2 classes}
2. Robot body {4 classes}
3. Autonomy {2 classes}
4. Sensing and Perception {6 classes}
5. Control Loop {4 classes}
6. Locomotion, and Kinematics and mapping {6 classes}
7. Advanced control loop {4 classes}
8. Human-robot interaction {2 classes}
9. Multi-robotics: Formations, self-organization, collaboration {10 classes}